WHAT IS CLAIMED IS:

1. A method for monitoring an optical signal-to-noise ratio (OSNR) using a polarization-nulling method, comprising the steps of:

(a) linearly polarizing an arbitrarily polarized optical signal including an unpolarized ASE noise;

(b) separating the optical signal and the ASE noise from the linearly polarized optical signal including the unpolarized ASE noise to measure a power of the optical signal and a power of the ASE noise included in a bandwidth of an optical signal; and

(c) obtaining the optical signal-to-noise ratio (OSNR) using the measured optical signal power and ASE noise power.

2. The method according to claim 1, wherein the step (a) is performed by allowing the arbitrarily polarized optical signal including the unpolarized ASE noise to pass through a rotating quarter-wave plate.

3. The method according to claim 1 or 2, wherein the step (b) further comprises the steps of:

allowing the linearly polarized optical signal including the unpolarized ASE noise to pass through a rotating linear polarizer;

measuring a minimum power and a maximum power of the signal outputted from the rotating linear polarizer; and

measuring the power of the optical signal and the power of the ASE noise included in the bandwidth of the optical signal from the measured minimum power and maximum power of the signal outputted from the rotating linear polarizer.

4. An apparatus for monitoring an optical signal-to-noise ratio (OSNR) using a polarization-nulling method, comprising:

a rotating quarter-wave plate adapted to linearly polarize an arbitrarily polarized optical signal including an unpolarized ASE noise more than four times during the 360 degree rotation of the quarter-wave plate to output the linearly polarized optical signal;

a rotating linear polarizer adapted to output an signal having a power varying with an angle between the polarization state of the inputted optical signal including the unpolarized ASE noise from the quarter-wave plate and the polarization state of the linear polarizer;

a measuring means adapted to a minimum power and a maximum power of the signal outputted from the rotating linear polarizer; and

a calculating means adapted to measure a power of the optical signal and a power of the ASE noise included in a

bandwidth of an optical signal according to the measured minimum power and maximum power of the signal inputted thereto from the measuring means to obtain the optical signal-to-noise ratio (OSNR).

5.   An apparatus according to claim 4, wherein the measuring means comprises a photodetector adapted to convert the signal inputted thereto from the rotating linear polarizer into an electric signal to output the converted optical signal, and the calculating means comprises a computer or a microprocessor adapted to obtain the optical signal-to-noise ratio (OSNR) according to the electric signal inputted thereto from the measuring means.